Amendments to Specification

Replace the paragraph beginning at page 15, line 1, in the specification as originally filed, with the following rewritten paragraph:

--It is also possible to enhance the sensitivity of the detection and demodulation device according to this invention for wavefields consisting of photons with energies close to the band gap of the semiconductor. It is known that photons with such long wavelengths (in the near infrared for silicon) penetrate deeper into the semiconductor, to a depth where no electric field normally reaches. For this reason, photogenerated charge must rely on a thermal diffusion mechanism to reach the surface, where electric fields are available for fast drift transports. The thermal diffusion mechanism is slow, since the transport time depends, on average, on the square of the distance to be travelled. For this reason it is desirable to adapt the demodulation device according to this invention to make ~~is~~ it suitable also for application with long-wavelength photons. This is achieved by fabricating an area of the opposite doping type of the semiconductor at the surface and by completely depleting this area with a suitable voltage. In this way, the transported charge carriers are majority charge carriers but since they move in the bulk of a completely depleted semiconductor, they benefit from very efficient transport properties and negligible losses, as described above, following the principles known from buried channel CCDs. The complete circuits for controlling and reading out the pixel signals are also fabricated in such areas of opposite doping type. All of these areas are electrically connected to ground potential. The semiconductor substrate is biased to a highly negative voltage of several tens of Volts in the case of a p-type substrate. In this way, the depletion region in the semiconductor substrate extends deeply into the semiconductor bulk, to depths of several tens of micrometers. In this mode, called "deep depletion", vertical electric fields extend deeply into the semiconductor, leading to fast and efficient drift transport of photogenerated charges also for longer wavelengths of the incident photons.--